the activation wavelength is at least 1000 L cm^{-1} M^{-1}.

57. (Amended) A method of PDT treatment of cardiovascular indications associated with occlusions of a blood vessel comprising the steps of:
administering a photosensitizing drug; and
delivering a photoactivating light to the blood vessel with a intravascular light delivering device at an activation wavelength within the range of about 440 to 610 nm such that the molar extinction coefficient of said drug at the activation wavelength is at least 1000 L cm^{-1} M^{-1}.

Remarks

The foregoing amendments to independent Claims 1 and 57 delete the term "about" from the upper end of the claimed ranges so that Claim 1 now claims "about 390 to 610 nm," and Claim 57 now claims "about 440 to 610 nm." Applicant also encloses marked-up copies of the amended claims as Appendix A. No new matter has been added and entry of these amendments is respectfully requested.

Response to Office Action

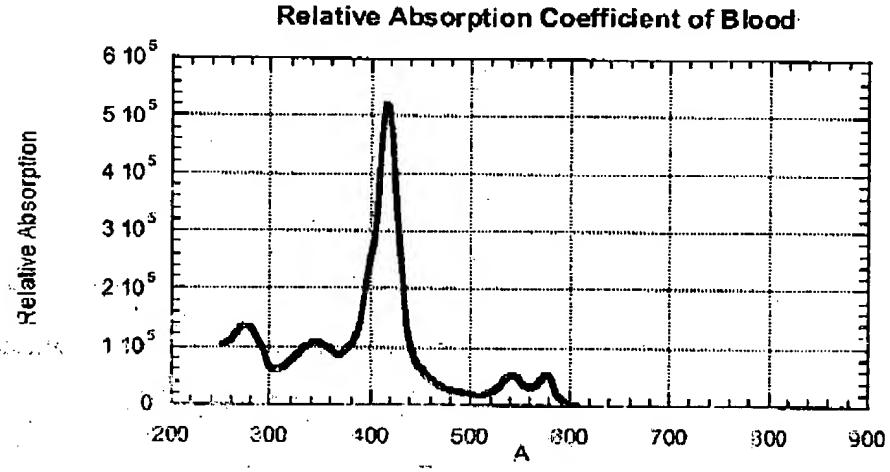
In the Office Action mailed May 9, 2003, the Examiner rejected claims 1-55 and 57-60 under 35 U.S.C. § 103(a) as being unpatentable over Lamuraglia (WO 01/24825 A2).

Applicant respectfully submits that the Lamuraglia reference does not teach or suggest all the limitations of Claims 1-55 and 57-60. Furthermore, based on the teachings of Lamuraglia, one skilled in the art would neither consider utilizing short wavelengths of light to excite a photosensitizer drug, nor appreciate the benefits of using short wavelengths of light for this purpose.

Lamuraglia generally describes a method of PDT treatment using wavelengths of light longer than 610 nm. Specifically, Lamuraglia teaches the use of 660 nm and 690 nm wavelengths. Contrary to the Lamuraglia reference, the present invention utilizes wavelengths of

light shorter than 610 nm to simultaneously achieve safety and efficacy. Here, shorter refers to a smaller value for the wavelength.

As shown below in the graph illustrating the wavelength dependence in the absorption of light by blood, there is a distinct change in the blood absorption of light near 610 nm:



At wavelengths shorter than 610 nm there is strong absorption of blood, whereas at wavelengths longer than 610 nm, blood absorption is weak. As the above-identified chart demonstrates, the two wavelength regions at issue (less than 610 nm and greater than 610 nm) are very distinct.

Due to blood absorption of light, efforts to date, including the method disclosed in Lamuraglia, have concentrated on the utilization of wavelengths greater than 610 nm. For example, the Lamuraglia reference advocates the use of long wavelengths to avoid blood absorption of light. See Lamuraglia, WO 01/24825 at p. 6 ("MB has a maximum light absorption at 660 nm, which allows deep and homogeneous tissue penetration by light which is unaffected by blood."); see also Lamuraglia, WO 01/24825 at p. 10 (preferred range "from about 680 and about 700 nm to avoid

blood absorption, preferably between about 625 nm and about 690 nm, and most preferably about 690 nm for BPD and about 660 nm for MB) (emphasis added).

In contrast to the Lamuraglia reference, the methods according to the present invention utilize blood absorption and this benefit is optimal at wavelengths shorter than 610 nm. The utilization of blood absorption is based on two conclusions we have made that are fundamentally different from the conclusions of the prior art: (i) the PDT treatment effect at efficacious levels cannot be selectively targeted to the vessel wall through reliance on drug selectivity alone because photosensitizer drugs do not localize with sufficient selectivity in the vessel wall; and (ii) strong absorption of light by blood at wavelengths shorter than 610 nm makes this wavelength range preferable for cardiovascular indications while the much weaker absorption of light by blood at wavelengths longer than 610 nm makes this range unacceptable for cardiovascular indications.

In the pending office action the Examining Attorney has indicated that "no clear distinction can be seen by the Examiner between the lower range of Lamuraglia of 'about 660 nm' (Lamuraglia at page 2, line 32) and applicant's claimed upper range of 'about 610 nm.'" In response to the Examining Attorney's concerns, Applicant has amended independent Claims 1 and 37 to delete the term "about" in Applicant's claimed upper range of "about 610 nm." Furthermore, as demonstrated in the above-identified chart, the disclosed range of "about 660 nm" in the Lamuraglia reference would not fall to 610 nm because there is a distinct change in the blood absorption of light at 610 nm.

Accordingly, the methods according to the present invention are patentably distinguishable from the method disclosed in Lamuraglia and furthermore, based on the teachings of Lamuraglia, one skilled in the art would neither consider utilizing short wavelengths of light to excite a photosensitizer drug, nor appreciate the benefits of using short wavelengths for this purpose.

Therefore, reconsideration and withdrawal of the rejection based on this reference are respectfully urged.

Respectfully submitted,

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Typed or printed name	Roxana Wizorek		
Signature		Date	11/7/2003

APPENDIX A

Pursuant to 37 CFR 1.121 (c)(1)(ii) the following are versions of the replacement claims marked up (by brackets for deleted matter) to show changes

1. (Amended) A method of PDT treatment of cardiovascular indications associated with occlusions of a blood vessel comprising the steps of: administering a photosensitizing drug other than psoralen compounds; and delivering intravascular photoactivating light to the blood vessel at an activation wavelength within the range of about 390 to [about] 610 nm such that the molar extinction coefficient of the photosensitizer drug at the activation wavelength is at least 1000 $L\ cm^{-1}\ M^{-1}$.

57. (Amended) A method of PDT treatment of cardiovascular indications associated with occlusions of a blood vessel comprising the steps of: administering a photosensitizing drug; and delivering a photoactivating light to the blood vessel with a intravascular light delivering device at an activation wavelength within the range of about 440 to [about] 610 nm such that the molar extinction coefficient of said drug at the activation wavelength is at least 1000 $L\ cm^{-1}\ M^{-1}$.